The presence of Dr. Chittenden in our midst enables us to offer a welcome to a representative of our great kindred across the seas, with whom we are on terms of the most affectionate alliance—strengthened as it is, or as we trust it soon will be, by a permanent treaty of arbitration dealing with any and every difficulty such as may sometimes arise even between close friends.

Dr. Chittenden is professor of physiological chemistry at Yale, and director of the Sheffield Scientific School of Yale University, where his researches have led him to advocate a much less plentiful diet than is usually found to give satisfaction. He was for ten years president of the American Physiological Society. He is already Doctor of Philosophy and Doctor of Science, and is well known as the author of important works on the physiology of nutrition, which have been based on researches to which he has devoted the labour of many years. He has come to Birmingham by invitation to open a discussion in the Section of Therapeutics, which has attracted much interest.

Prof. Chittenden is welcome as a distinguished representative of American university teachers, and we are honoured by enrolling his name on the list of our honorary graduates. I present to you for the degree of Doctor of Laws

Russell Henry Chittenden.

Among all the movements of our time fraught with benefit for the human race, surely the conquest of the broad belt of the earth from the diseases which ran riot there, and the fitting for white habitation of those sun-favoured regions, is among the most promising.

We do not forget that our Chancellor has exerted himself to promote the activity of officers of the Crown in this direction, and to-day we have the pleasure of welcoming one of the enthusiastic pioneers in this endeavour.

Sir Francis Lovell, Baronet, C.M.G., Fellow of the Royal College of Surgeons, has held high office in our colonies, especially in the West Indies, and has been entrusted with various missions on sanitary questions for the Colonial Office. He served his country first in the then deadly district of Sierra Leone, and subsequently was for many years chief medical officer and president of the General Board of Health and member of the Council of the Government, first of Mauritius, and then of Trinidad and Tobago. His active services abroad lasted from the early 'seventies into the present century, and now continue during his holidays, for he devotes his well-earned leisure to the promotion of the study of those diseases which render tropical climates fatal to Europeans and cause a high rate of mortality among the native populations.

As dean of the London School of Tropical Medicine, and as president of the Section of Tropical Diseases at this meeting of the British Medical Association, I have special pleasure in presenting

Francis Henry Lovell.

James Alexander Macdonald is Doctor of Medicine of the Royal University of Ireland and physician to the Taunton and Somerset Hospital. He is the chairman of council of the British Medical Association, and was for three years chairman of the representative meeting of that body. He is also a member of the General Medical Council, in which he sits as a direct representative of the medical profession. His work in the association, and the important offices he has so ably filled, mark him out for the distinction which the University desires to confer upon him. For the honorary degree of Doctor of Laws I present to you

James Alexander Macdonald.

The University rejoices at the opportunity of welcoming on this occasion many representatives of foreign nations, with all of which we cordially desire to be, not only at peace, but to be linked by ties of friendship and mutual effort—all harmoniously working together for the increase of civilisation and the welfare of the human race. Two of these representatives I shall have the honour of presenting on this occasion. Dr. Oppenheim, Doctor of Medicine and titular professor of the University of Berlin, is a neurologist of great distinction and the author of many important books on his subject. He has opened a discussion in the Section of Neurology at this meeting. His reputation extends all over the world and is of the highest kind. He is the author of a text-book which has been translated into many languages and is accepted as a standard work. His standing and repute as a scientific physician are such that no honour we can confer can enhance his dignity. I present for our honorary degree

Hermann Oppenheim.

Of the self-governing Dominions of the Crown we welcome a representative in Dr. R. A. Reeve, Bachelor of Arts, Doctor of Medicine, who is professor of ophthalmology in the University of Toronto, and was for many years dean of the faculty of medicine there. He enjoys a wide reputation in Canada as a specialist in diseases of the eye, and the position he occupies is sufficiently attested by his having been elected president when the association met in Toronto in 1906. As a distinguished representative of the Dominion of Canada, the University is proud to add his name to its roll of graduates. I present to you

Richard Andrews Reeve.

In the person of the eminent surgeon Dr. Strassmann we recognise another representative of a great and friendly nation, and to him the introductory remarks prefixed at the presentation of our honorary graduate Dr. Oppenheim equally apply.

Dr. Strassmann is titular professor and assistant to the chair of obstetrics and gynæcology in the University of Berlin, the author of many monographs on various subjects in his department, and an accomplished operating surgeon. He is visiting Birmingham by invitation to take part in the proceedings of the Section of Obstetrics and Gynæcology, in which he has this morning opened a discussion. The University welcomes him as a shining example of sterling ability in his branch of practice, and empowers me to present for the honorary degree of Doctor of Laws

Paul Strassmann.

The professor of pathology in the University of Cambridge is a friend of many of us, and a man regarded with affection wherever he is known, whether in Edinburgh, in Cambridge, or in Birmingham; for Sims Woodhead is no stranger to this University, which he has indeed served in the capacity of an external examiner. He is an M.D. of Edinburgh, the editor of *The Journal of Pathology*, the author of a manual of practical pathology, and for some years was superintendent of a research laboratory in Edinburgh University. Moreover, he is a member of the Royal Commission on Tuberculosis, and has carried out an enormous amount of experimental research in connection with that subject. Little of this work is known to the public, and the University is glad to recognise it by enrolling among its honorary graduates the name of

German Sims Woodhead.

SCIENTIFIC ASPECTS OF THE UNIVERSAL RACES CONGRESS.

It appears that the idea of a Universal Races Congress first originated with Prof. Felix Adler, of New York, but its realisation is due to the untiring energy and enthusiasm of Mr. Gustav Spiller. The avowed object of the congress was "to discuss, in the light of science and the modern conscience, the general relations subsisting between the peoples of the West and those of the East, between so-called white and so-called coloured peoples, with the view of encouraging between them a fuller understanding, the most friendly feelings, and a heartier cooperation." Invitations to attend the congress were scattered profusely, and delegates were appointed by a very large number of Governments and institutions, and there was an attendance of more than two thousand members. Rarely, if ever, have so many different nationalities and varieties of mankind been gathered under one roof. From this point of view the congress was an undoubted success; the bringing together of this heterogeneous assembly was no small task, and it cannot be doubted that the spirit of friendliness that permeated the congress, and the introduction to one another of varied peoples with similar or analogous aims, were all to the good, and will have permanent beneficial results.

The main work of the congress consisted of speeches and resolutions, as well as of the papers which were published before the meeting in a volume of nearly five hundred pages entitled "Inter-racial Problems" (P. S. King and Co.). These were taken as read, but many of the writers had a further opportunity of stating their views. The official meetings of the congress were held on July 26–29 in the large hall of the University of London, a room which, unfortunately, has bad acoustic properties. As a very large number of persons were invited or volunteered to speak, the time given to each was necessarily limited, and in consequence most of them spoke very rapidly, and often not distinctly; various languages were employed, and the oppressively sultry weather made it difficult to concentrate attention. The conditions were not favourable to a real discussion, and the proceedings were necessarily more of the nature of orations, sometimes perfervid, on a multiplicity of topics. On the previous Tuesday, however, an attempt was made to organise discussions on "The effects of miscegenation on intelligence and character," and "The influence of environment in forming and changing racial characteristics." These two problems and "the general problems of the conditions of progress" were also discussed on the Wednesday morning.

Prof. F. von Luschan in his printed paper states that "As long as man is not born with wings, like the angels, he will remain subject to the eternal laws of Nature, and therefore he will always have to struggle for life and existence. . . . Nations will come and go, but racial and national antagonism will remain; and this is well, for mankind would become like a herd of sheep if we were to lose our national ambition and cease to look with pride and delight, not only on our industries and science, but also on our splendid soldiers and our glorious ironclads." In his speech he humorously admitted that he was swimming against the stream of the congress, which was certainly the case. Dr. Haddon maintained that Dr. von Luschan had only partially stated the case; he assumed that it was largely on account of his weakness and social habits that man diverged from the other anthropoids; the least advanced peoples are, if anything, over-socialised, and all through human history progress depends upon the balance between individualism and collectivism, between self-help and mutual aid. Mr. John Gray, in opposition to the sentiments of many present, frankly stated that all men were not equal and never would be, nor was it desirable that they should be; but, on the other hand, equal opportunities should be given to all, so that the more capable should not be stifled. Drs. von Luschan and Haddon agreed that there were practically no pure races still existing, and that a discussion of races was not suitable for a congress such as this, as it was mainly of academic interest; the former went so far as to state that the old Indo-European, the African, and the east Asiatic all branched off from the same primitive stock, perhaps hundreds of thousands of years ago, "but all three forming a complete unity, intermarrying in all directions without the slighest decrease of fertility." This does not, however, mean, as some would have liked to believe, that there is no racial difference between men.

Prof. Lyde printed an informing paper on the climatic control of skin-colour. Most anthropologists admit this control, which, however, has not yet been sufficiently studied, nor are the very numerous exceptions yet accounted for. Colour has long been recognised as but a very secondary factor in race discrimination, and it was distinctly pointed out that the question of race was a purely zoological problem, and must be solved by zoological methods. Nearly every speaker confounded peoples with races, but perhaps this is inevitable among those who have not had a biological training; this confusion of terms is manifest in the first printed paper on the meaning of race, tribe, nation, by Dr. Brajendranath Seal, who speaks of a "national race" of complex elements. He also says "We may arrange the types of physical race . . . (1) . . . by a modified genealogical tree (with devices for intercrossing and retrogression), or by symbols and formulæ analogous to those of organic chemistry (as in arranging isomers, polymers, &c.) . . . (2) . . . in space (or more simply on a plane surface) the distance along different directions marking the degree of affinity as estimated by three (or two) groups of correlated characters. . . . A third way would be to conceive an ideal type as the goal towards which the normal development of the organism is tending, and to place the actual types round this as a centre, at distances corresponding, more or less, to their approximation to the ideal." Anyone who has tried to make an arrangement of human types on a plane surface will appreciate how impossible it is to do so in anything like a satisfactory manner; but who is to decide what is "the ideal type" (or does he mean "ideal types"?) "to which the normal development of the organism is tending"? He adds:—"Though the third method is not quite feasible, an occasional application of this test of normal or standard development is a useful corrective."

It is scarcely to be expected that this suggestion, if it were carried out, would lead to much precision, as we cannot be sure of what we are going to develop into. A classification of existing types must necessarily be static, a phylogeny (assuming that the requisite data are available) is dynamic, an ideal type is mainly a matter of sentiment, a goal is prophecy which belongs more to the domain of philosophy than to that of science. Later he says "No view of civilisation is sound or adequate which considers Race and Racial types statically, and not dynamically as growing, developing progressive entities"; however this may be, ethnologists will not entirely agree with Principal Seal when he says "There are other phenomena which are abnormal, pathological, implying degenerative transformation of structure or function. Cannibalism, promiscuity, Morgan's consanguineous marriage, group marriage, infanticide, black magic, &c., are of this class. In the first place they are far outside the line from the ape to the civilised man . . . and secondly, natural selection would ruthlessly weed out stocks in which such impulses would be normal. It follows, therefore, that, when such phenomena appear, as they undoubtedly do, among savages or primitive folk, they are not part and parcel of their normal physico-psycho-social type, but are phenomena of degeneration or retrogression in those peoples."

There are one or two other papers dealing with anthropological subjects, among which may be noted a valuable essay by Dr. C. S. Myers on the permanence of racial mental differences. Prof. Earl Finch writes on the effects of racial miscegenation, and he presents "some facts tending to prove that race blending, especially in the rare instances when it occurs under favourable circumstances, produces a type superior in fertility, vitality, and cultural worth to one or both of the parent stocks." This view was maintained, on the whole, in the preliminary discussion on the Tuesday, the manifest exceptions to the statement being explicable mainly by the unsatisfactory social conditions of half-breeds—in other words, the problems of miscegenation are sociological rather than physiological. In a paper on the instability of human types Prof. Franz Boas summarises his observations on European immigrants into New York, to which the attention of readers of NATURE has already been directed. He makes the very remarkable statement that "the child born in America, even if born only a few months after the arrival of the parents, has the head-form of the American born." The investigations of Prof. Boas were referred to by others as demonstrating the uncertain character of physical traits in racial problems and the rapid effect of the environment; a tendency, however, is observable for others to go beyond the conclusions arrived at by Prof. Boas. It was pointed out that so far Prof. Boas has not given us his methods, nor has he stated what precautions he has taken to control the personal equation of his numerous assistants; a further possibility of error lies in the working up of the statistics. Doubtless this information will be given in his final report.

The ethnologist will find various interesting facts and conclusions in some of the other papers, more especially those dealing with the negro in Africa and America. A lantern demonstration on the methods of racial discrimination and classification was given by Dr. Haddon on Thursday evening. There was also organised in connection with the congress an exhibition of nearly two thousand photographs, &c., representing a large number of peoples, and including a series of coloured drawings of types painted expressly for the occasion by Mr. Norman H. Hardy. A large number of books and pamphlets dealing with ethnological subjects were also on view. The exhibition of illustrations and literature was a great attraction, and was of great educational value. Considering the very few people connected with the congress who knew or cared about scientific matters or methods, the scientific results may be considered as fairly satisfactory.

THE INSTITUTION OF MECHANICAL ENGINEERS.

THE summer meeting of the Institution of Mechanical Engineers was held at Zurich and northern Switzerland, commencing on Monday, July 24. In addition to the meetings for the reading and discussion of papers, an extensive programme of visits to works and hydro-electric power stations had been arranged, and formed an important part of the meetings. The works visited included those of Brown Boveri, Esher Wyss and Co., Oerlikon Machine Works, Sulzer Brothers, and the Swiss Locomotive and Machine Works. The power stations at Rheinfelden, Laufenburg, Wangen, Schaffhausen, Beznau, and Löntsch were also included. The institution dinner was held on July 25. Brief notices of the papers read are given below, and a fuller abstract of a paper on high-pressure water-power works will appear in a later issue.

A paper on electric traction in Switzerland was presented by Mr. E. Huber-Stockar, of Zurich. It may be found astonishing that progress in electric traction has not been greater in Switzerland when one considers that it is necessary to buy all the coal supply from foreign countries, and that a large amount of water-power is still undeveloped. Further, Switzerland has had certain railways electrified at a comparatively early date, and might have been expected to go onward on this basis, especially as applied electricity is highly developed in the country generally. Economy of operation is having a decisive weight, and makes the problem, as it is presented, difficult. The railways already electrified, or about to be electrified in the near future, are such that the smoke nuisance would be an almost prohibitive feature with steam traction, as in the case of the Simplon tunnel, or where the capabilities of steam are near exhaustion, as in the case of the St. Gothard Railway. There are two gauges in use, 1·435-metre "normal" and 1-metre "narrow." There has been but slow progress in normal-gauge railways since 1883, and rapid progress in narrow-gauge railways since 1887.

The author describes very fully several typical Swiss railways and the methods of operation. Reference is made to the valuable scientific work which has been carried out by the Schweizerische Studiencommission für electrischen Bahnbetrieb. This society has investigated such problems as the elucidation of the question of general railway electrification under Swiss conditions. The merits of the several systems, the cost of plant and of operation, and the comparison of steam and electricity for definite lines or groups of lines. The electrification of the St. Gothard Railway, to be carried out in the near future, has been well prepared by the work of this society.

Railway electrification is making noteworthy rather than rapid progress in Switzerland. As regards system, single-phase current of low periodicity (15) and high contact-line voltage, varying from 5000 to 15,000, according to circumstances, is being sanctioned by experience and by authority. All electrification in Switzerland is directly connected with the utilisation of water-power. The heavy variations of load and the rapid seasonal variations in the fresh-water supply make water storage desirable, and even imperative.

A short survey of the practical development of the Diesel oil engine up to the present day was given by Mr. F. Schubeler, of London. It will be remembered that the characteristics of the Diesel principle are compression in the working cylinder up to the ignition temperature of the fuel (about 500 lb. per square inch and about 1000° F.) and the use of an independent multiple-stage air-pump for raising the pressure of the injection air to 600 or 850 lb. per square inch; the injection air is used for the introduction of atomised air into the cylinder. The extreme high pressures and temperatures of the Diesel process put a limit to the dimensions of the cylinders, which will scarcely exceed 30 inches in diameter. Assuming 150 revs. per min. and the ordinary Otto cycle, this corresponds to an approximate cylinder output of 300 to 400 horse-power. It is not desirable to have more than six cranks; hence, in dealing with large powers, it becomes necessary to seek means of increasing the specific cylinder output. For this there are three possibilities:—(1) by carrying out the single-acting Otto cycle machine as a double-acting one; (2) by adopting the single-acting two-stroke cycle process; (3) by adopting the double-acting two-stroke cycle process. The first method approximately doubles the cylinder output; the second produces the same result, but necessitates the provision of special scavenging pumps; the third theoretically quadruplicates the cylinder output, but in practice about 3·4 may be secured.

For small and medium size units the single-acting Otto cycle takes the preference. Such machines have worked for periods of six to eight weeks without interruption, even in cement factories and mills. The two-stroke cycle shows a somewhat higher consumption of fuel, amounting at least to the percentage of the energy absorbed by the air-pump; it has, however, a more favourable turning moment, and guarantees better starting and better conditions for regulation, which is specially important for direct coupling with alternators. The space required is smaller, and the engine is lighter and cheaper. There are many difficulties involved in the problem of the double-acting Diesel engine, and the author deprecates the proceeding at once to the double-acting two-stroke cycle without first gaining experience with the single-acting engine. Some firms have already claimed to be able to carry out a double-acting two-stroke marine engine. The results obtained with such engines are unknown to the author, and he feels somewhat doubtful whether success has already attended such efforts. Attempts have been made to build Diesel locomotives. The adoption of the Diesel engine for motor-cars and aëroplanes does not seem to be very promising.

Dr. Alfred Amsler, of Schaffhausen, described two new types of transmission dynamometers. The first of these is of the torsion type, and is intended for measuring the power transmitted to or from high-speed machines. The dynamometer couples the shaft of the driving engine direct to the driven machine, and consists essentially of a shaft the angle of twist of which gives a measure of the torque. To measure the angle of twist three discs are used, one fixed to one end of the shaft and the other two fixed to the other end. A transparent celluloid rim is attached to the first disc, and has divisions cut on it; each of the other two discs has a radial slit. The scale divisions are strongly illuminated, and may be clearly read through the slits when the shaft is running. An impression is given to the eye every revolution, and at high speeds these impressions become a continuous stationary image.

The other type of dynamometer is intended for use with slow-running machines of variable resistance. Two pulleys are placed close together on a common shaft, one being fixed to the shaft and the other pulley runs loose. The pulleys are connected by means of two cylinders fitted with pistons and charged with oil. The drive from the source of power is communicated to one pulley by belt, and the machine under test is driven by belt from the other pulley. In operation, the oil in the cylinders is put under pressure corresponding to the torque being transmitted. The shaft is hollow, and serves to make communication between the cylinders and a pressure gauge, the readings of which give a measure of the torque.

A paper on rack-railway locomotives of the Swiss mountain railways was read by Mr. T. Weber and Mr. S. Abt, of Winterthur. Switzerland has a total of 120 steam locomotives, as well as 45 electric locomotives and motor coaches arranged for working with rack gear. The total length of the rack railways is 87 miles. The whole of the systems of racks which are in use have been designed in Switzerland. The Abt system has been most adopted, and consists of flat-toothed plates, of which two or three, according to the tractive power, are bolted together on chairs in such a way that the tooth of one plate in regard